TRP-C28H

Isolated 4 Channel Digital Input with counter and 4 channel AC Relay Modbus TCP Module Support TRP-ASCII, Modbus RTU/ASCII protocol

User's Manual

Printed Aug. 2013 Rev 1.0

Trycom Technology Co., Ltd
No.35, Zhongxing Rd., Guishan Township, Taoyuan County 333, Taiwan.
Tel : 886-3-350-3351 Fax: 886-3-350-3352
Web: www.trycom.com.tw

Copyright

Copyright Notice: The information in this manual is subject to change without prior notice in order to improve reliability, design and function and dosed not represent a commitment on the part of the manufacturer. No part of this manual may be reproduced, copied, or transmitted in any form without the prior written permission of manufacturer. Acknowledgment Products mentioned in this manual are mentioned for identification purpose only. Products manes appearing in this manual may or may not be registered trademarks or copyright of their respective companies.

1. Introduction

TRP-C28H an Isolated Digital Input with counter and AC Relay Modbus TCP Module, provides 4 channels optical isolated digital input channels and counter and 4 Channel AC Relay that allow you to input the logic signal from +/- 0 to 30V DC and 5A /250V AC relay on network, it supports 3 communication Protocol, TRP-ASCII, Modbus RTU / ASCII, TRP-C28H can be easy and convenient to use application supports Modbus.

Software engineers can use the TRP-ASCII or Modbus RTU command set quickly and easily integrated into the self-development program, such as Microsoft VB, VC...

TRP-C28H built-in independent IP, WEB-browsing more convenient to rewrite the configuration and collect information through computers, tablet computers, smart phones, will be available!

TRP-C28H built-in watchdog function to ensure the normal operation of the module, and a built-in voltage monitoring to ensure that the boot, excellent and advanced hardware for harsh environment.

TRP-C28H with another TRP-C28H remote control directly, do not need to run the software and equipment.

TRP-C28H also offers the maximum connection 16 host client to link the network server that is easy to operate in Modscan32 ,Modbus Poll, CAS Modbus Scanner and SCADA ...application uses TCP mode and Virtual-COM mode.

1-1.Features

- Wide input range DC power supply.
- Automatically determine 3 TRP-ASCII and Modbus RTU/ASCII communication protocol.
- 16 TCP Port can be open at the same time.
- Heart Beat function ensures a reliable communicating connection.
- Support Virtual-COM mode.
- WEB PAGE can be directly read IO status.
- Easily update the firmware using the Internet.
- Back to factory configuration by external touch Button.
- Auto reconnection when power or Ethernet fail.
- Digital input signal from +/- 0 to 30V DC.
- Built-in surge absorbers in each relay N.C and N.O.
- Built-In watchdog function prevents system boot fail.
- LED for each I/O channels working status.
- Support Auto-MDIX twisted pair crossover detection and Auto-Correction.
- Power/Link/8 CH D I/O LED indicator.
- DIN-Rail and panel mount support.
- Dual power input select from screw terminal or DC-Jack..

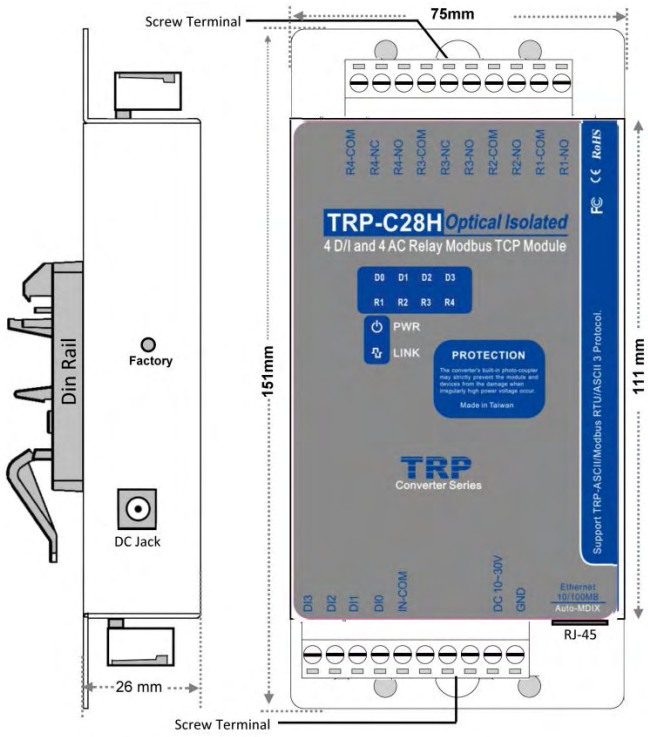
1-2.Specification

- Power Input Voltage DC +10V to +30V.
- Protocol: TRP-ASCII and Modbus RTU/ASCII.
- Input channel: 16 digital input channels with counter.
- Input digital input counter: 0~65535.
- Input optical isolation: 3750 Vrms.
- Input logical level 0 +1V (max).
- Input logical level 1 +4.0V ~ +30V.
- Output channel: 4 channel power reply outputs.

- Relay type: 2 Form A (RL1,RL2) , 2 Form C (RL3,RL4).
- Contact ratting: 5A /30V DC , 5A /120V AC , 5A /250V AC.
- Relay surge strength: 4000V.
- Relay operating time: 3mS.
- Relay operating life: 2 X 10(7).
- Communication interface: Ethernet RJ45.
- Configuration mode: Device Manager, WEB settings.
- Matching remote control: with another TRP-C28H.
- Heart Beat: TCP Port sent string every 5 seconds.
- TCP Maximum Connection:1~16.
- Module ID :1~255.
- Connection type: Screw terminal for maximum AWG 12 wire.
- Power supply: Screw terminal, or external DC adapter.
- Power consumption 320mA/12V.
- Operating environment: 0 to 50℃.
- Storage temperature:. -10 to 70℃.
- Humidity: 10~90% Non-condensing.
- Dimension: 151mm X 75mm X 26mm .
- Weight: 395g.

2. Hardware Description

2-1. Panel layout



Notice: The Module provides two type power inputs, optional DC-JACK or Screw Terminal input, not to two used together!

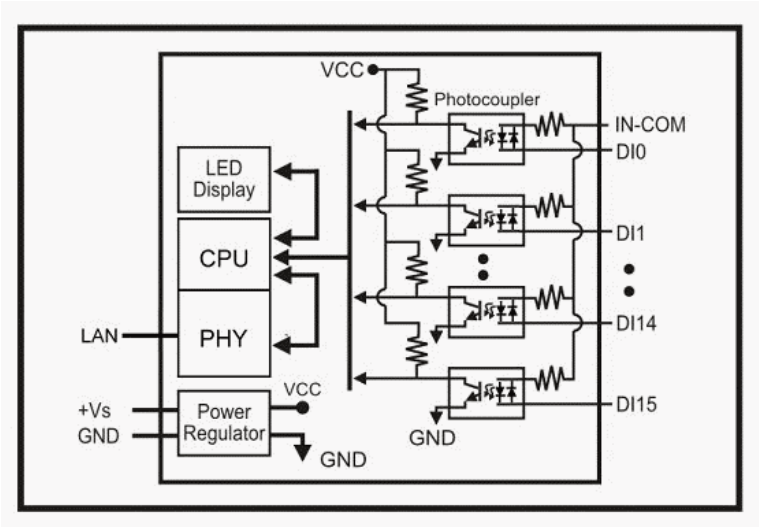
PWR LED: Blinking is ready.

LINK LED: RJ-45 cable connection and data active.

D0~D3/R1~R4 LED: Each digital status indication.

DC Jack: Power Input DC +10V to +30V, Please use the 5.5*2.1mm DC JACK.

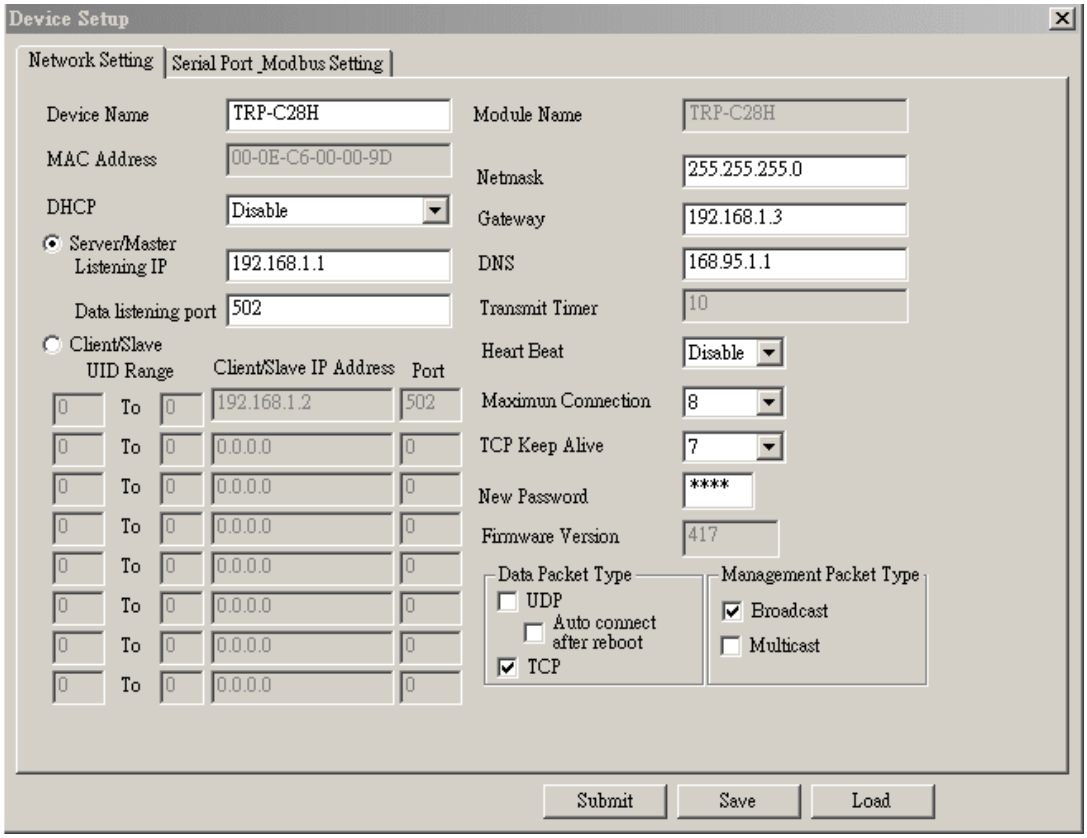
2-2. Block Diagram

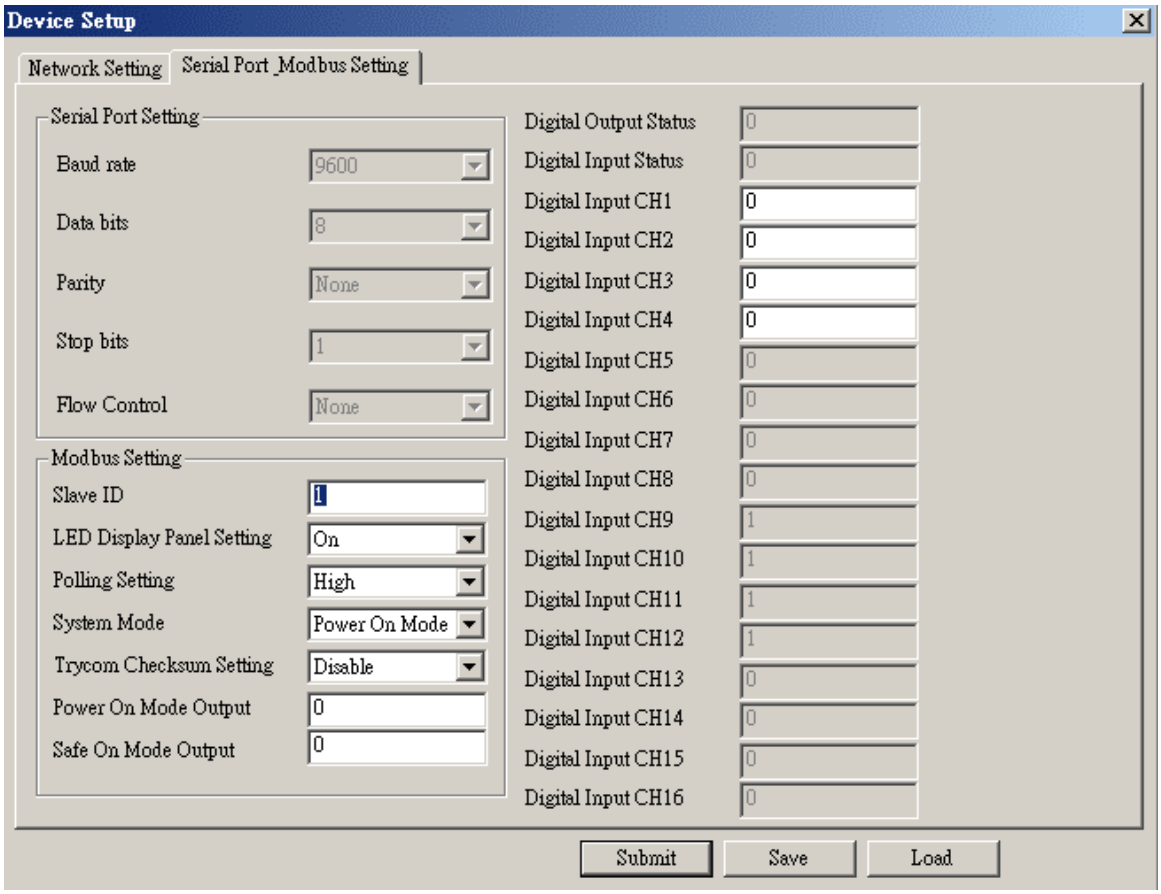


2-3. Factory Button

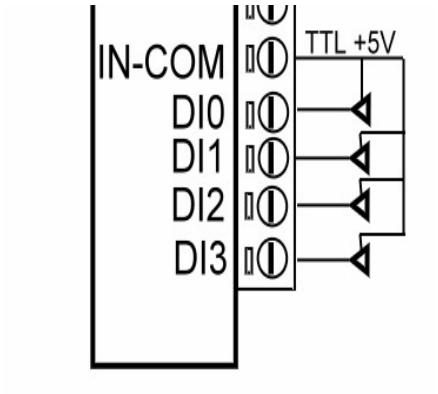
Hold down the button, and then power on, until the power light flashes, Release the button.

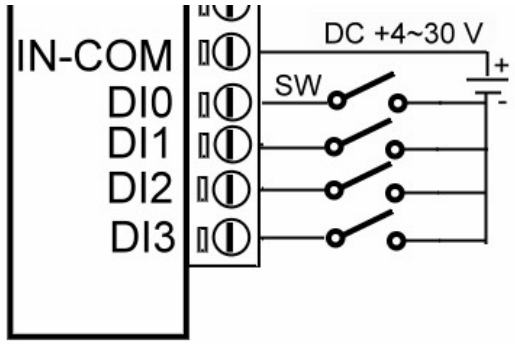
2-4. Factory parameter values

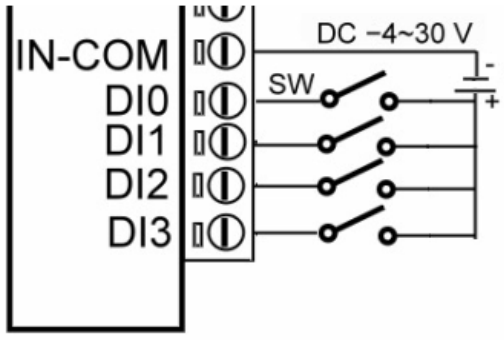


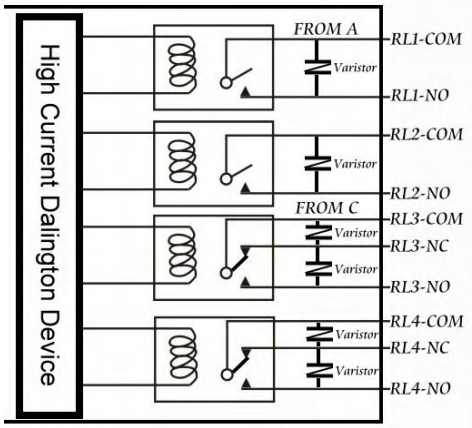


2-5. Screw Terminal Pin assignment Description









2-6. Pin Description

DI3	Digital input Channel 3	R4-COM	Relay 4 common
DI2	Digital input Channel 2	R4-NC	Relay4 Normal Close
DI1	Digital input Channel 1	R4-NO	Relay4 Normal Open
DI0	Digital input Channel 0	R3-COM	Relay 3 common
IN-COM	The isolated side power input MAX.30V	R3-NC	Relay3 Normal Close
N.C	Not connected	R3-NO	Relay3 Normal Open
N.C	Not connected	R2-COM	Relay 2 common
N.C	The isolated side ground	R2-NO	Relay2 Normal Open
DC 10~30V	Input DC 10~30V	R1-COM	Relay 1 common
GND	Power Ground	R1-NO	Relay1 Normal Open

3.Install TRP-C28H Hardware

STEP1: Connect power source with TRP-C28H, the PWR LED will blinking.

STEP2: Connect TRP-C28H with network by RJ45 cable.

If the cable is properly connected the “LINK” LED will light up.

*The TRP-C28H Support Auto-MDIX, A straight-through or crossover RJ45 cable can be used to make a connection directly to the HUB/Router/PC LAN port.

STEP3: Connect TRP-C28H screw terminal wiring, such as 2-5 picture description.

4. How to configure TRP-C28H

**Please note that the computer's IP segment adjusted with TRP-C28H same section, modify the parameter values in order to effectively store!*

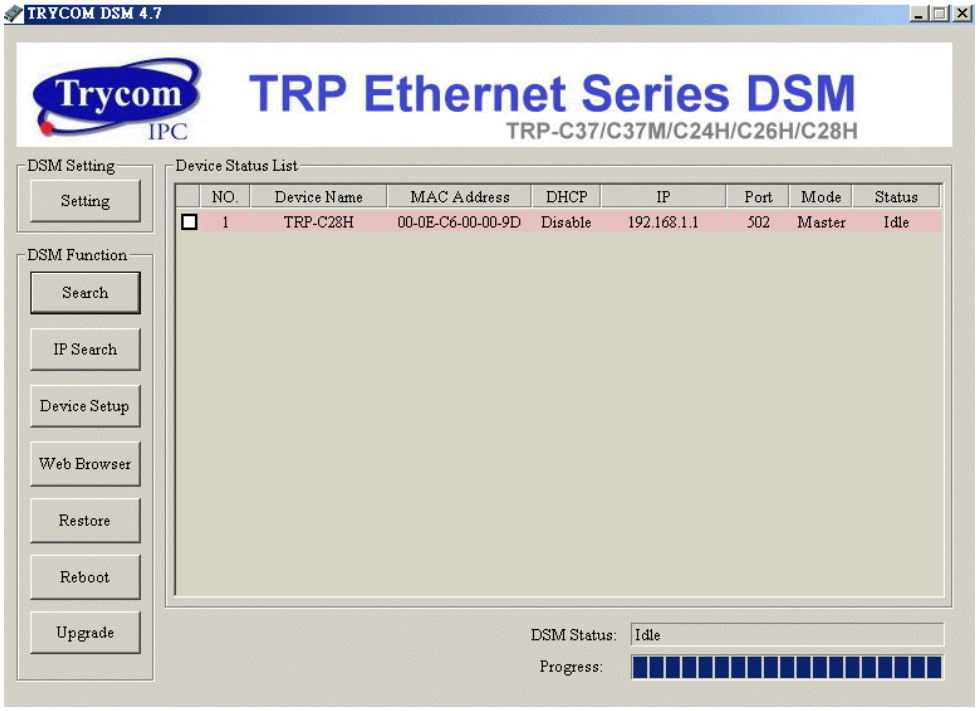
For example:

Computer IP is 192.168.1.xx

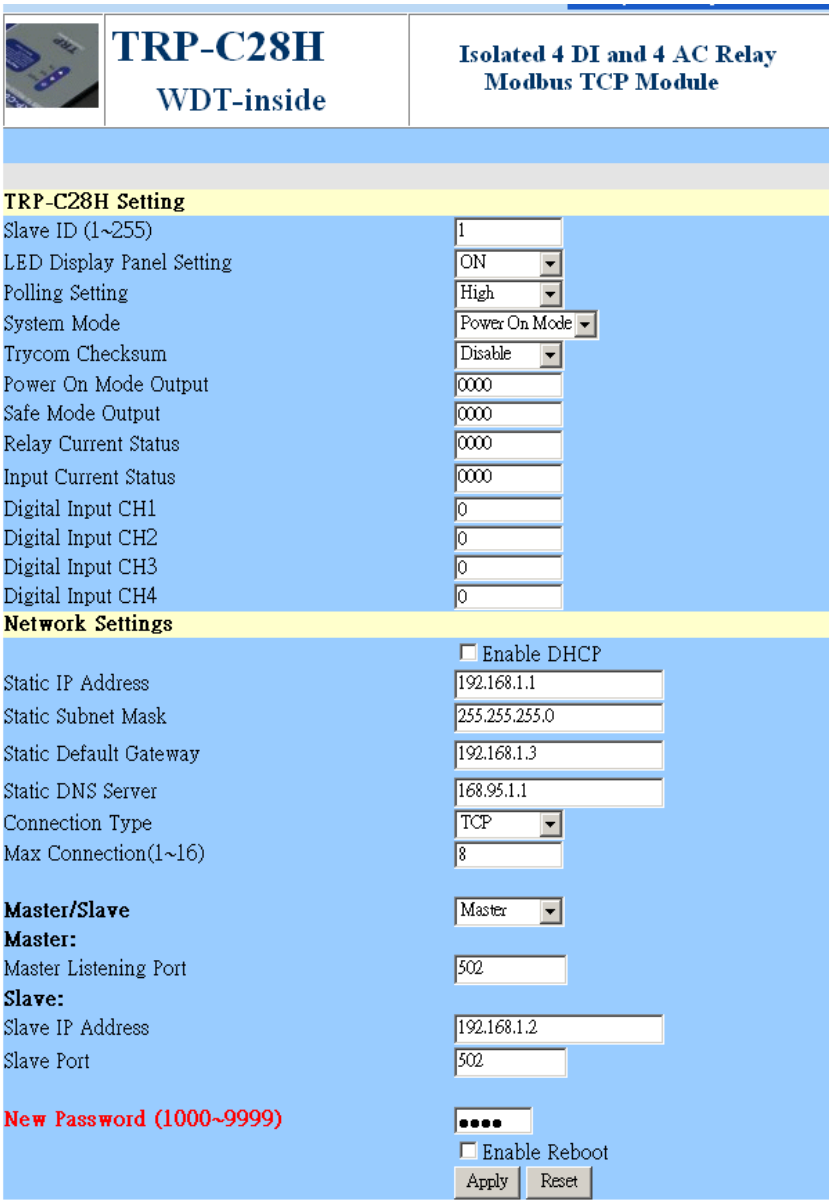
TRP-C28H 192.168.1.1

There are 2 ways can change the module parameter values.

A.DSM Software


TRYCOM DSM 4.7
Trycom
IPC
TRP Ethernet Series DSM
TRP-C37/C37M/C24H/C26H/C28H
DSM Setting
Setting
DSM Function
Search
IP Search
Device Setup
Web Browser
Restore
Reboot
Upgrade
Device Status List
NO. Device Name MAC Address DHCP IP Port Mode Status
1 TRP-C28H 00-0E-C6-00-00-9D Disable 192.168.1.1 502 Master Idle
DSM Status: Idle
Progress:

B. WEB Server


TRP-C28H
WDT-inside
Isolated 4 DI and 4 AC Relay
Modbus TCP Module
TRP-C28H Setting
Slave ID (1~255) 1
LED Display Panel Setting ON
Polling Setting High
System Mode Power On Mode
Trycom Checksum Disable
Power On Mode Output 0000
Safe Mode Output 0000
Relay Current Status 0000
Input Current Status 0000
Digital Input CH1 0
Digital Input CH2 0
Digital Input CH3 0
Digital Input CH4 0
Network Settings
Enable DHCP
Static IP Address 192.168.1.1
Static Subnet Mask 255.255.255.0
Static Default Gateway 192.168.1.3
Static DNS Server 168.95.1.1
Connection Type TCP
Max Connection(1~16) 8
Master/Slave Master
Master:
Master Listening Port 502
Slave:
Slave IP Address 192.168.1.2
Slave Port 502
New Password (1000~9999)
Enable Reboot
Apply
Reset

4-1. Using DSM Utility

The DSM utility software performs several functions:

A: Searching for TRP-C28H connected to the network.

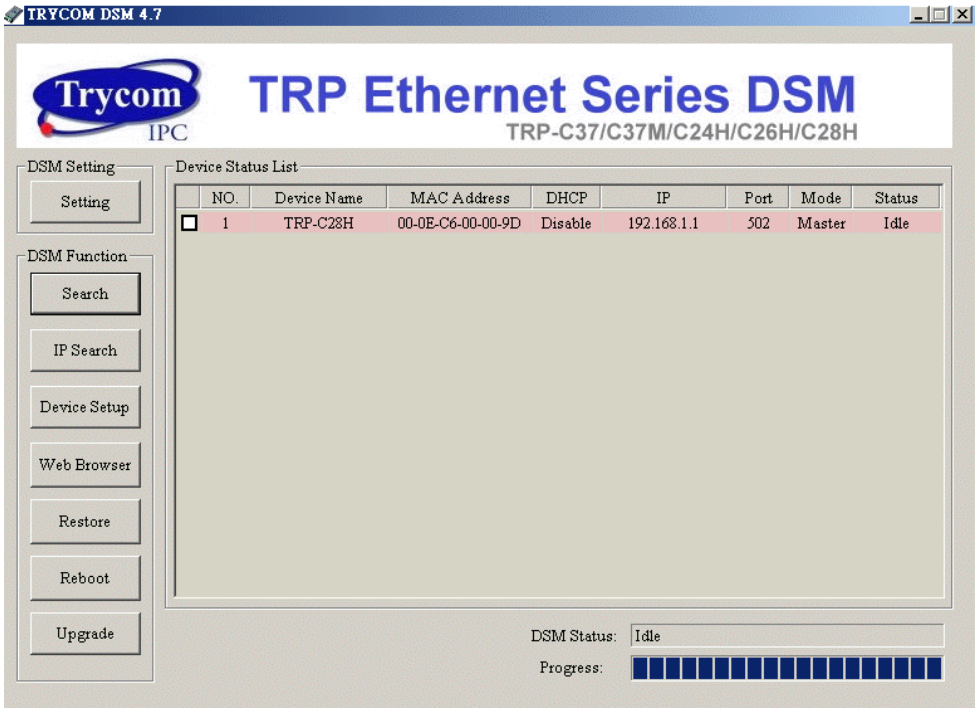
B: Displaying and changing the configuration.

C: Upgrading the TRP-C28H firmware, Refer the Firmware upgrade help file.

D: Saving and Loading Configuration from external log File or memory.

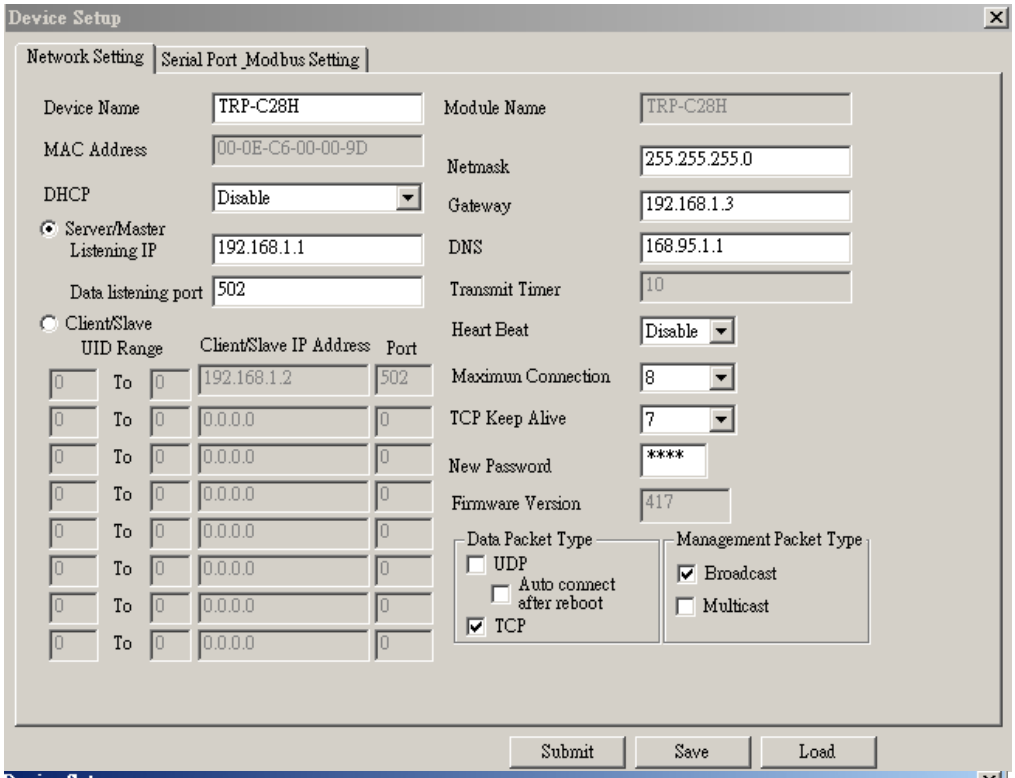
4-2. Searching TRP-C28H

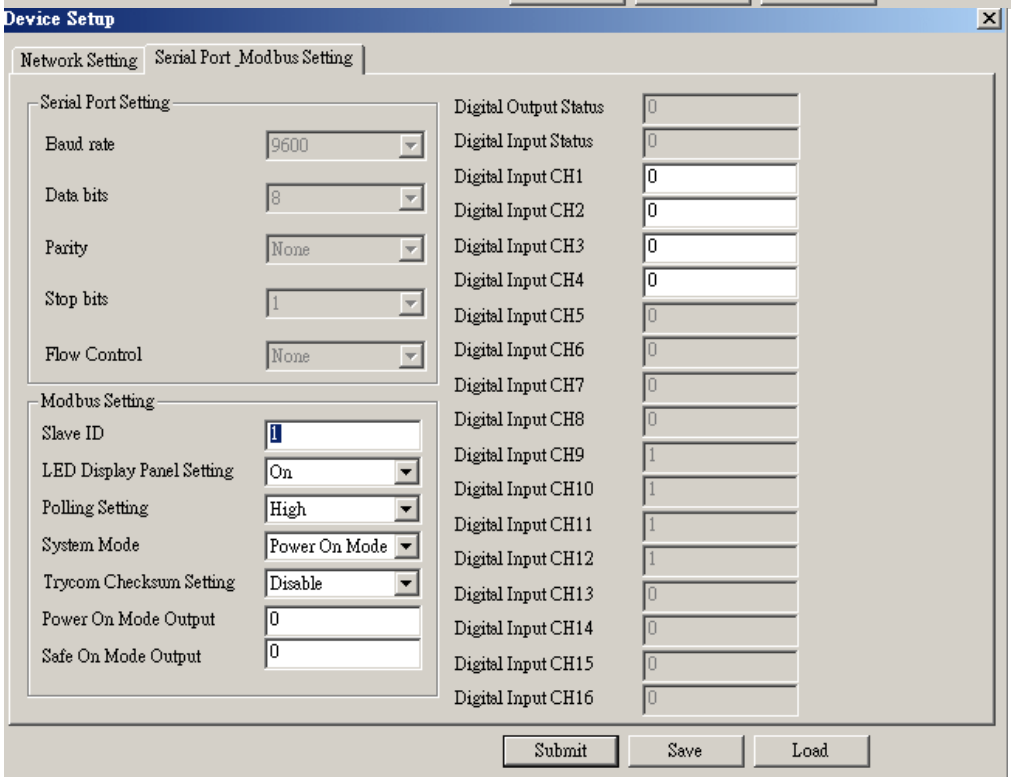
Once TRP-C28H is connected to the network the **DSM** software will search it and display it in a window by name, IP address, Mac….Information.



4-3.Configuring Server Properties

Select the “NO.” item and Double click to open the module configuration, after setting then click “Submit” will save the configuration to memory.





◆ Device Name:

Device server name, Maximum 10 chars.

◆ Model Name:

TRP-C28H.

◆ MAC Address

The TRP-C28H MAC address.

◆ DHCP

If DHCP is disabled, it allows user setting the IP address, Subnet mask, Gateway.

If DHCP is enabled, the IP address, Subnet mask, Gateway address will be dynamically configuration by DHCP server such router.

When DHCP is enabled, but the DHCP server is not available on the network, the TRP-C28H will timeout then back to factory setting IP=192.168.1.1.

◆ Server Listening IP

The TRP-C28H IP address.

◆ Server Data listening port

TRP-C28H port address.

◆ Client Destination IP

When user using the pair mode, the client setting need to input module IP and port which one need to connect.

◆ Client Destination port

Client port address.

Port**:** 16 bit number. (1 ~ 65535)

◆ Netmask

The default LAN Netmask is configured for a Class C address. This maybe reconfigured by the user.

◆ Gateway

Input the gateway IP address that can be allows users to access the serial server from internet.

◆ DNS

Short for Domain Name System, an Internet service that translates domain names into IP addresses. Because domain names are alphabetic, they're easier to remember. The Internet however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address.

◆ Transmit Timer: This feature is only available to Serial Server TRP-C37 and TRP-C37M.

◆ Maximum Connection: 1~16

The function allows the user to configure the TRP-C28H in Server mode, adjust 1~16 TCP client host connections.

◆ TCP Keep Alive: 1~7 /Minute

When TRP-C28H in Server or Client mode, the TRP-C28H without data over the 1~7 Min setting value,
The TRP-C28H will be disconnecting TCP port.

◆ New Password: 1234

It only accepts value from1000~9999 integer, if input the wrong password over 5 times, the WEB-Page will lock until the TRP-C28H re-boot.

◆ Firmware Version: ABC

◆ Slave ID:1~255.

ID performs MODBUS RTU / ASCII and TRP-ASCII will use to address.

◆ LED Display Panel Setting :ON/OFF

The setting will turn on all panels LED or Turn off panel LED.

◆ Polling Setting: High/Low.

Digital High / Low potential settings, Applies only TRP-C26H/C28H

◆ System Mode

Power ON Mode: Digital output state when the TRP-C28H Power On.

Save ON Mode: The digital output state when the TRP-C28H is working, Once this mode is set, the digital output state cannot be rewritten.

Pair Mode: It can be used as a remote manual remote control, when the TRP-C24H 16 DO 和 TRP-C26H 16 CH DI, TRP-C28H 4 D I/O with TRP-C28H 4 D I / O. Without any driver.

Trycom Checksum setting: Disable/Enable.

TRP-ASCII command used bit checksum.

◆ Power On Mode Output: 0000~FFFF.

Digital output state when TRP-C28H Boot!

◆ Save ON Mode Output:0000~FFFF.

Digital output state when watchdog enable!

◆ Digital Output Status

Display last stored in the memory of the digital output state.

◆ Digital Input Status

This feature is only available to TRP-C26H and TRP-C28H,

Display last stored in the memory of the digital input state.

◆ Digital Input CH1~CH16

Display last stored in the memory of the digital input counter value.

This feature is only available to TRP-C26H and TRP-C28H.

◆ Submit

Save the setting value to memory.

◆ Save

Save the setting value to external log file.

◆ Load

Load the setting value to external log file.

◆ Upgrade

Upgrade the TRP-C28H firmware.

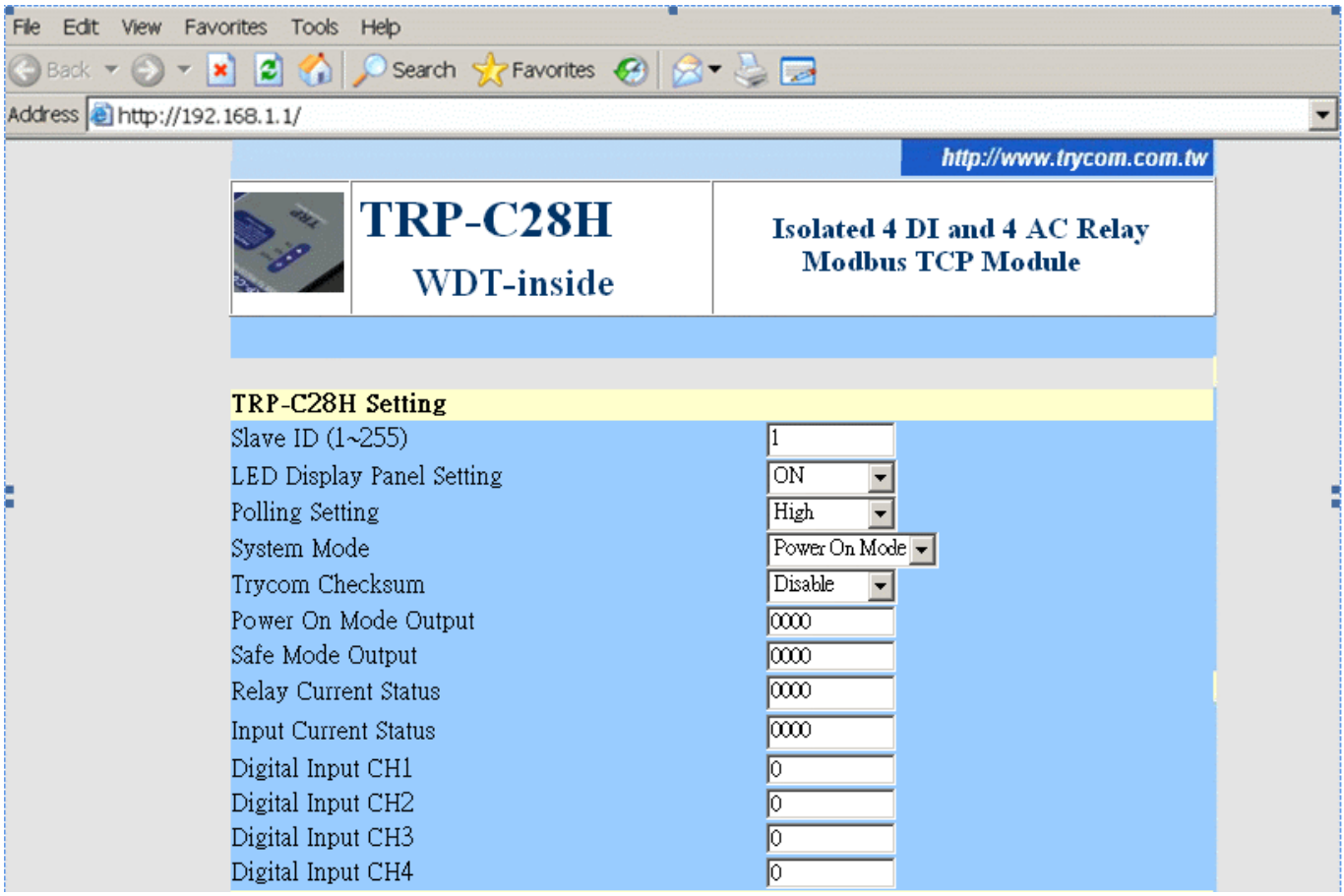
4-4.Using the WEB Server mode

The Web Server can be used to configure the TRP-C28H from any web browser software (such as I.E).

In Internet Explorer type the IP Address of the TRP-C28H into the address field and press the Enter key. The following window will appear:

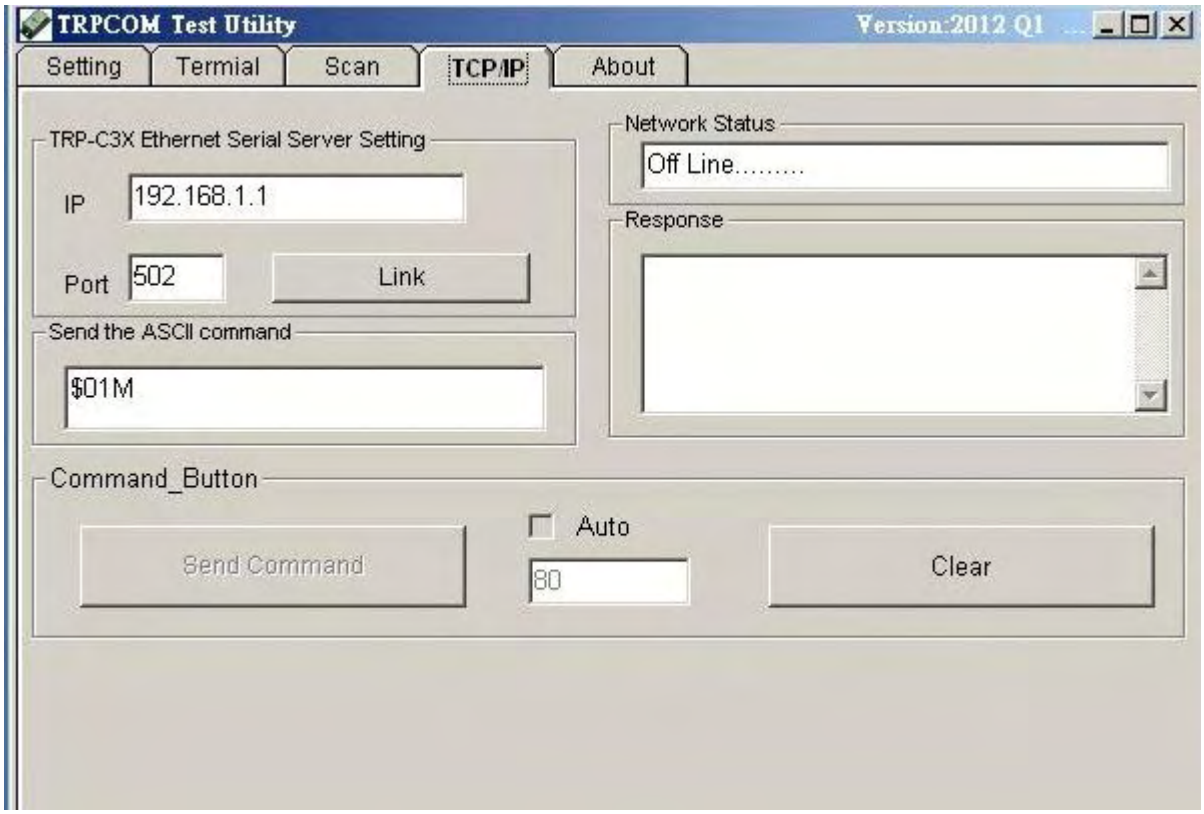
Example:

If TRP-C28H's IP is 192.168.1.1 ,Please Input the 192.168.1.1 then enters at web address, the web-page will appear.



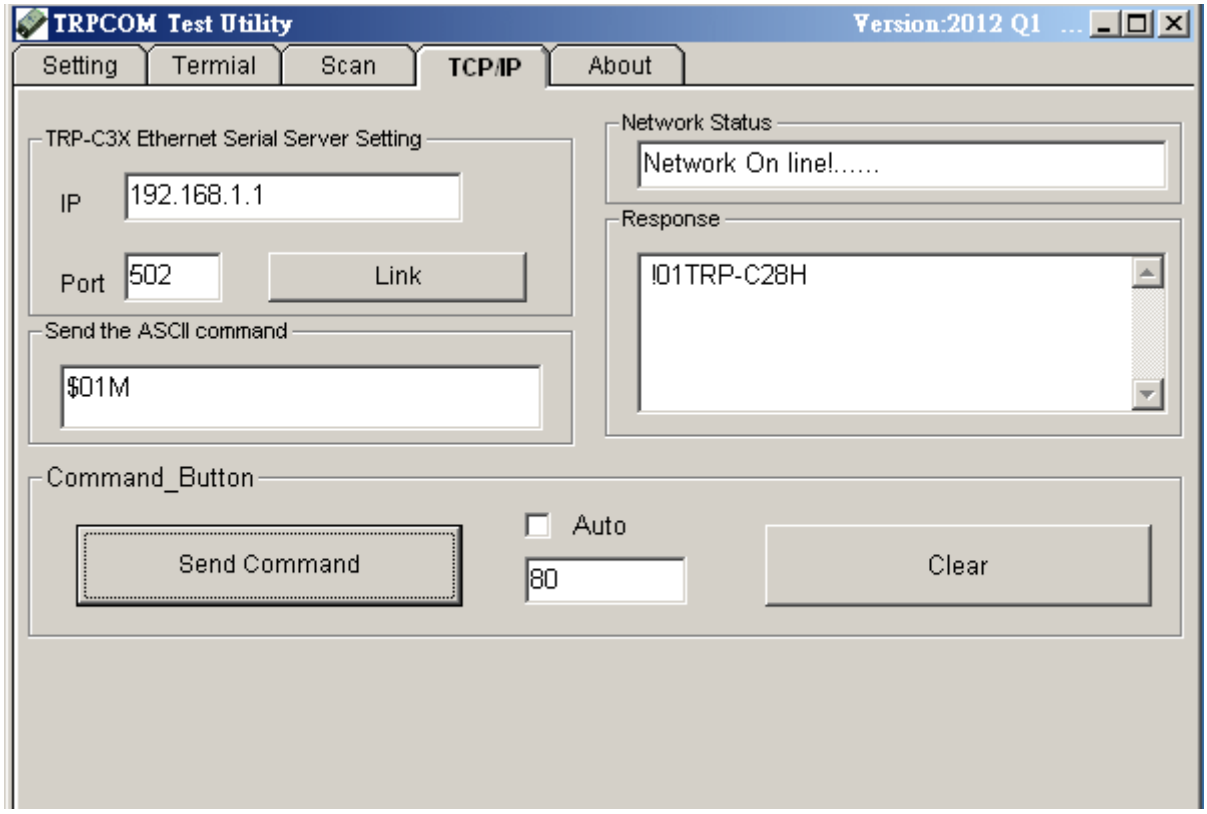
4-5. TRPCOM Test Utility

The TRPCOM test utility may help to use the debugging program development phase, the user can find this software in our CD internal directory copied to the hard disk, and then directly execute TRPCOM.exe.



The execution TRPCOM.exe, enter the IP & Port click "Link" button

It can be input the TRP-ASCII instruction set.



5. TRP-ASCII Communication Protocol

TRP-C28H supports three modes of communication Protocol TRP-ASCII, Modbus RTU, Modbus ASCII.

TRP-ASCII Command Protocol Description

Command Format :"Leading Code"+"ID Address"+"Command"+"CHK"+(cr) .

at :"Leading Code"+"ID Address"+"Data"+"CHK"+(cr) .

How to calculate the checksum

1. Calculate all characters of the command string to get the ASCII sum, except the character return.

2. Mask the sum of string with 0FFH.

Example:

Send the command is "$06M".

Sum of string is "$"+"0"+"6"+"M"="24H"+"30H"+" 4D"="A1H"……The checksum and [CHK]="A1".

Response string with checksum is :" A1".

TRP-ASCII: ease of use TRP-ASCII integration to develop their own software, such as VB, VC .

Command List	Function Description	Paragraph index
%IDNNPP00DD(CHK)(cr)	Setting module configuration	See 5-1
#IDN (CHK)(cr)	Read digital input channel counter value	See 5-2
#IDCN(CHK)(cr)	Clear digital input N channel counter value	See 5-3
#IDCW(CHK)(cr)	Clear all digital input counters value	See 5-4
#IDCS(CHK)(cr)	Save all digital input counters value	See 5-5
$IDLS(CHK)(cr)	Read digital input latched	See 5-6
$IDC(CHK)(cr)	Clear digital input latched	See 5-7
#IDPPDD (CHK)(cr)	Digital Output Data	See 5-8
$ID6 (CHK)(cr)	Read digital input/output status	See 5-9
$IDF (CHK)(cr)	Read the module's firmware version	See 5-10
$IDM (CHK)(cr)	Read the module's name	See 5-11
$01RS(CHK)(cr)	Reset Module	See 5-12
~IDONN (CHK)(cr)	Change the module's name	See 5-13
~IDLEDA(CHK)(cr)	Set the module's LED operating mode	See 5-14
~IDWE (CHK)(cr)	Enable watchdog	See 5-15
~IDWD (CHK)(cr)	Disable watchdog	See 5-16
~IDWR (CHK)(cr)	Read watchdog status	See 5-17
~ID4V (CHK)(cr)	Read power on/Safe on mode	See 5-18
~ID5V (CHK)(cr)	Set the digital output status Power on/Save Mode status	See 5-19

5-1. Setting module configuration

Command	%IDNNPP00DD(CHK)(cr)	
Syntax Description	%	First leading code
	ID	Address of setting module 00-FF(HEX)
	NN	New address of setting from 00-FF(HEX)
	PP	The Digital I/O module type define to 40
	00	00
	DD	Data format
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

DD: Data Format

Bit	7	*6*	5	4	3	2	1	0
Function	0	*Checksum 0:Disable 1:Enable*	0	0	0	0	0	0

EX: Send command:"%0103400000".

New ID is "03",D I/O type is "40" ,Checksum setting disable is "00", Response:"**!01**".

5-2. Read digital input channel counter value

Command	#IDN(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00-FF(HEX)
	N	Digital Input channel 0~3
	CHK	Checksum
	(cr)	Carriage return
Response	!IDCCCCC(CHK) (cr)	Command valid CCCCC from 0~65535
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#012" Read the TRP-C26H channel 2 counter value

Response: "!0100023".....The digital input have been trigger 23 times.

5-3. Clear digital input N channel counter value

Command	#IDCN(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00-FF(HEX)
	CN	Digital Input channel N=0~F
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#01C0"…Clear channel 0 counter value.

Response: "!01"..... Command valid.

5-4. Clear all digital input counters value

Command	#IDCW(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00-FF(HEX)
	CW	Clear all channels counter values
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#01CW"…Clear all channels counter value.

Response: "!01"….. Command valid

5-5. Save all digital input counters value

Command	#IDCS(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00-FF(HEX)
	CS	save all channels counter values
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK) (cr)	Command valid
	?ID (CHK)(cr)	Command Invalid

Ex: Send command:"#01CS"…Clear all channels counter value.

Response: "!01"….. Command valid

5-6. Read digital input latched

Command	$IDLS(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	LS	S=0 Latch logic 0, S=1 No use.
	CHK	Checksum
	(cr)	Carriage return
Response	!IDLLHH(CHK)(cr)	LL=DI0~DI7 status, HH=DI8~DI15 status.
	?ID(CHK) (cr)	Command Invalid

Ex: Send command:"#01L0"…Read all channels latch value.

Response: "!01000F"….. All channels have been trigger.

5-7. Clear digital input latched

Command	$IDC(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	C	Clear CH0~CHF Lactch.
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command vaild
	?ID(CHK) (cr)	Command Invalid

Send command:"$01C"…….Clear digital input latch .

Response:"!01 "…… Latch have been clear.

5-8.Digital Output Data

Command	#IDPPDD(CHK)(cr)	
Syntax description	#	First leading code
	ID	Address of setting module 00-FF(HEX)
	PP	D I/O type :0A/ 00 DO0~DO3 low byte data (Multi-Channel) :1L/ AL: DO0~DO3 low byte data (Single-Channel) L=0~3
	DD	DD:00~FF (Milti-Channel) DD:00 or 01 (Single-Channel)
	CHK	Checksum
	(cr)	Carriage return
Response	>(CHK)(cr)	Command valid
	!ID(CHK) (cr)	Parameter invalid (*Command data error!)
	?ID (CHK)(cr)	Command Invalid

**Multi-Channel mode (Output control for one BYTE)*

EX: Send command :"#010A02"…..CH 1 Relay 1 ON.

Response:">"……. Command valid.

EX: Send command:"#01000A"…...CH1 nad CH3 Relay ON.

Response:">"……. Command valid.

EX: Send command:"#01000G"…Data="0G"…….Data error!.

Response:"?0"…….Parameter error! .

*Single-Channel mode(Output control for one BIT)

EX: Send command:"#011001"….. CH0 Relay ON.

Response:">"……. Command valid.

Send command:"#011201"….. CH2 Relay ON.

Response:">"……. Command valid.

5-9.Read digital input/output status

Command	$ID6(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	6	Read digital output status
	CHK	Checksum
	(cr)	Carriage return
Response	!ID0L0H(CHK)(cr)	L=DO0~DO3 status, H=DI0~DI3 status.
	?ID(CHK) (cr)	Command Invalid

EX: Send command:$016…….Read digital output status .

Response:”!010308”…….DO1,DO2,DI3...Enable.

5-10. Read the module’s firmware version

Command	$IDF(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	F	Command for reading module’s version
	CHK	Checksum
	(cr)	Carriage return
Response	!IDMODDDMMYY(CHK)(cr)	MOD :The module’s model DD: Date MM: Month YY : Year
	?ID(CHK)(cr)	Command Invalid

EX: Send command:$01F…Read the TRP-C28H’s version.

Response:”!01C24H090113”……. The TRP-C28H’s version date is “01/09/2013”.

5-11. Read the module's name

Command	$IDM(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	M	Reading module's name
	CHK	Checksum
	(cr)	Carriage return
Response	!IDNNNNNNNNN(CHK)(cr)	NNNNNN :The chars from 1~9 chars
	?ID(CHK)(cr)	Command Invalid

EX: Send command:$01M…Read the TRP-C28H's name.

Response:"!01TRPC24H"……. The module's name is "TRPC24H".

5-12. Reset Module

Command	$IDRS(CHK)(cr)	
Syntax description	$	First leading code
	ID	Address of setting module 00-FF(HEX)
	RS	Reset Module
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"$01RS"

Response:" !01"……. . Command valid!

5-13. Change the Module ‘s name

Command	~IDONN(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	O	Change Module Name
	NN	NN : 1~9 characters char
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:”~01O123456789”…Change Name.

Response:” !01”……. . Command valid!

Send command:$01M…Read the TRP-C28H’s name.

Response:”!01123456789”……. The module’s name is “TRPC24H”.

5-14. Set LED operating mode

Command	~IDLEDA(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	LED	Set the module’s LED operating mode
	A	A=1 Turn off all LEDS, when Output Enable= ON. A=0 Turn on all LEDS, when Output Enable= OFF.
	CHK	Checksum
	(cr)	Carriage return
Response	!IDNN(CHK)(cr)	NN=ON or OFF Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send command:”~01LED1”….. Turn off all LED, when Channel Enable ON.

Response:”!01OFF”……. . Command valid.

5-15. Enable Watchdog

Command	~IDWE(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	WE	Watchdog function
	CHK	Checksum
	(cr)	Carriage return
Response	!ID(CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~01WE"…….Enable Watchdog .

.. Response:" !01"……. Command valid.

**The user can not change the digital output state when watchdog enable,*

this mode will keep until the watchdog disable.

When the watchdog enable digital output into safe mode.

There are 3 ways you can set the safe mode, command / WEB / DSM.

5-16. Disable Watchdog

Command	~IDWD(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	WD	Disable Watchdog
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~01WD"…Watchdog Disable.

Response:" !01"……. . Command valid!

5-17. Read Watchdog State

Command	~IDWR(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	WR	Read Watchdog State
	(cr)	Carriage return
Response	!IDWN (CHK)(cr)	N=E Enable N=D Disable
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"~01WR"…Read Watchdog state.

Response:" !01WE"……. . Watchdog Enable.

5-18. Read Power on/Safe Mode

Command	~ID4V(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	4	Read power on/safe mode status
	V	V=P: Power on V=S: Safe mode
	CHK	Checksum
	(cr)	Carriage return
Response	!ID0L (CHK)(cr)	L:DO7~DO0
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:~014P…….Read Power on output status.

Response:" !0107"……. . Command valid.

EX: Send Command:~014S…….Read save mode output status.

Response:" !0108"……. . Command valid.

5-19. Set the digital output status Power on/Save Mode status

Command	~ID5V(CHK)(cr)	
Syntax description	~	First leading code
	ID	Address of setting module 00-FF(HEX)
	5	Save the current digital output is save or power on mode
	V	V=P Power on V=S Safe mode
	(cr)	Carriage return
Response	!ID (CHK)(cr)	Command valid
	?ID(CHK)(cr)	Command Invalid

EX: Send Command:"#010A07"… Digital output

Send Command: "~015P"…….Save Power on.

Send Command:"~014P" …….Read Power on

Response:"!0107".

6. Modbus RTU/ASCII Communication Protocol

** For more modbus RTU / ASCII protocol specification, please download from http://www.modbus.org website.*

Obtain more modbus TCP instruction test, we recommend user can be downloaded from the following Web site

Modbus Poll Test utility http://www.modbustools.com/

Modbusscan Test utility http://www.win-tech.com/html/modbus1.htm.

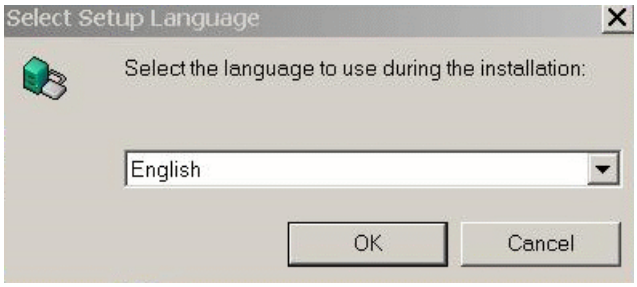
User can use the virtual-com program with TRPCOM.exe for Modbus RTU test; these programs can be found in our directory of the CD!

Install the Virtual-COM

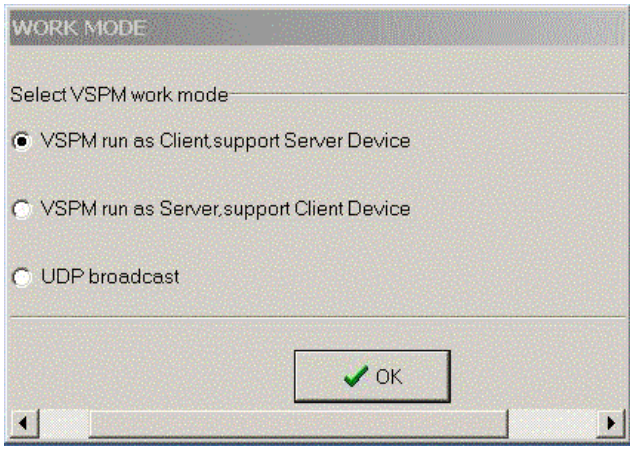
Step 1. Insert the TRP-Serial CD and find the TRP-C28H folder.

Step 2.Click “Vcomm.exe” icon then install Virtual-COM utility.

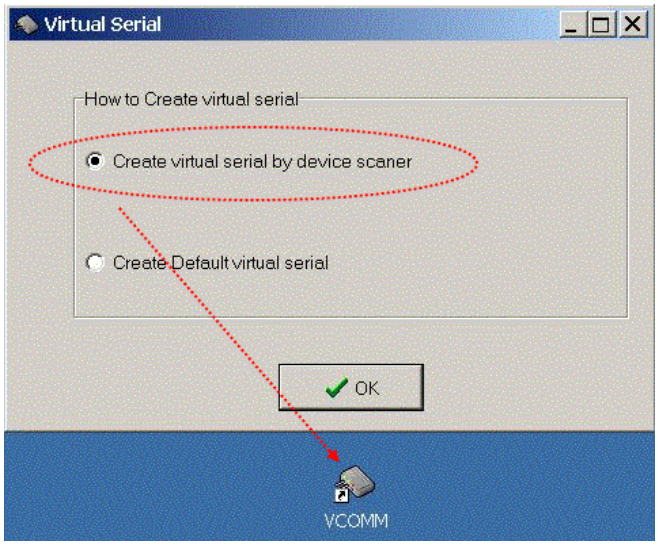
*The Virtual COM utility support multi-language, please select which language do you need.



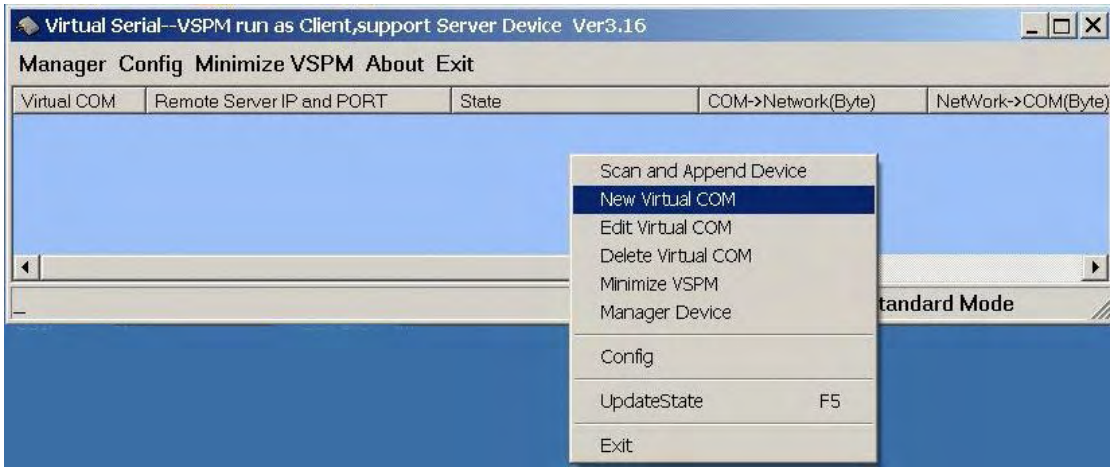
Step3. Click “OK” button and select “VSP run as Client support Server Device”.



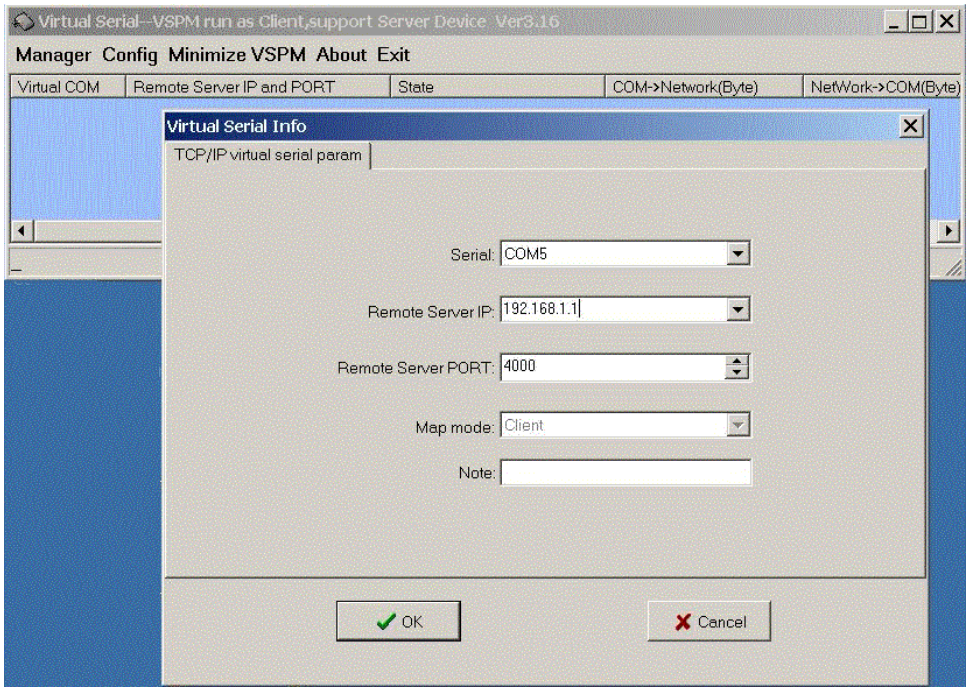
Step4. Select “Create virtual serial by device scanner”, then press “OK”



Step5. Run VCOMM.exe then click right button select “New Virtual COM”



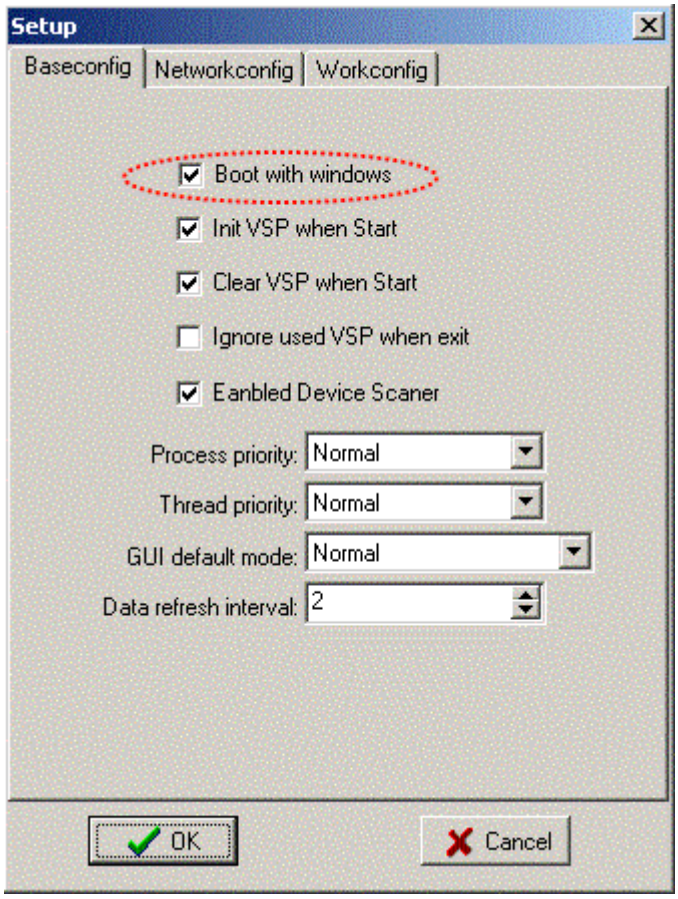
Step6. Select “Select Serial Port” and input TRP-C28H IP and port then press “OK”.



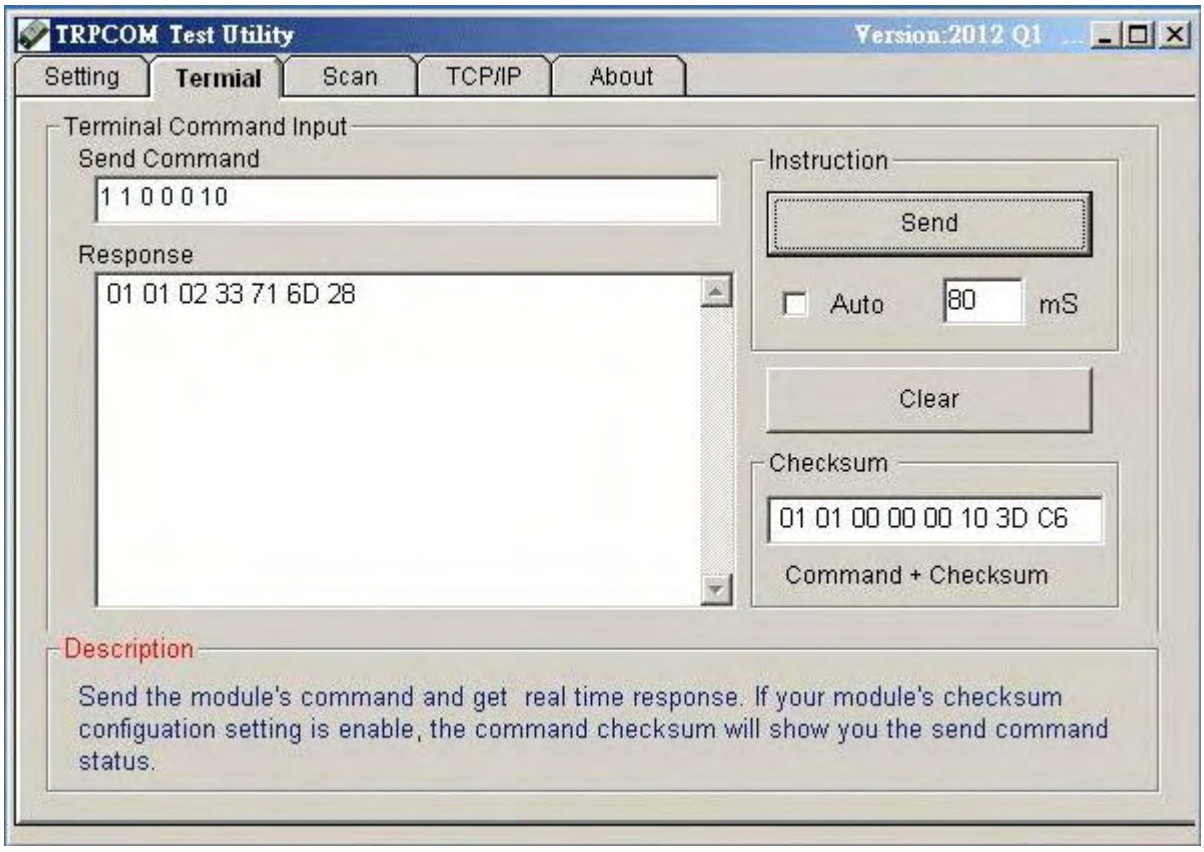
Step7. If Virtual-Com setting success, the display will appear bellow.

Step8. Run TRPCOM utility then select virtual-com port make a TRP-C28H command.

*If in VCOMM‘s configuration select “Boot with windows”, the virtual-com will Auto-connection when windows start.



** TRP-C28H in use the Virtual com mode, the default data format is 9600, N, 8,1, this mode is not allowed to change.*



Modbus TCP Command List

Command List	Function Description	C28H Description	Index
ID 01 00 SS 00 NN	Read Coils	Read relay output readback value	6-1
ID 02 00 SS 00 NN	Read Discrete Inputs	Read the current digital input value	6-2
ID 03 00 SS 00 NN	Read Holding Registers	Read the current relay output readback count value	6-3
ID 04 00 SS 00 NN	Read Input Registers	Read the current digital input count value	6-4
ID 05 00 SS DD 00	Write Single Coil	Write Single channel output data	6-5
ID 0F 00 SS 00 NN BC 0L	Write Coils	Write multi channel output data	6-6
ID 06 00 SS DD DD	Write single register	Write single channel counter value	6-7
ID 10 00 SS 00 CN BC DD DD ..	Write multiple registers	Write multi channel counter value	6-8
ID 10 00 00 00 01	Save multiple registers	Save multi channel counter value to memory	6-9

Additional modbus RTU command set

Command List	Function Description	Index
ID 46 00 00	Read the module's name	6-10
ID 46 04 IP 00 00 00	Setting module new ID	6-11
ID 46 07 00	Read the module's Firmware	6-12
ID 46 0B WS 00	Enable/Disable watchdog.	6-13
ID 46 0C 00	Read watchdog status	6-14
ID 46 0D 0S 00	Set up LED ON/OFF	6-15

6-1. Read Coils

Read relay output readback value

Command	ID 01 00 SS 00 NN		
Syntax Description	ID	1Byte	Address of setting module 1~247
	01	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0004
	00 NN	2 Bytes	Output channel number,0x0001~0x0004
Response	ID 01 BC 0L	4 Bytes	ID=1~247 01:Function Code BC: Byte counter 0L : Relay output read back value
Error Response	ID 81 ER	3 Bytes	ID=1~247 81 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example: Send command :" 01 01 00 00 00 04".....Read RL1~RL4 relay Output read back value.

Response:" 01 01 01 08"..... RL4 Enable.

6-2. Read Discrete Inputs

Read the current digital input value

Command	ID 02 00 00 00 NN		
Syntax Description	ID	1Byte	Address of setting module 1~247
	02	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000
	00 NN	2 Bytes	Input channel number,0x0001~0x0004
Response	ID 02 BC LL	4 Bytes	ID=1~247 02:Function Code BC: Byte counter LL : Digital current input value
Error Response	ID 82 ER	3 Bytes	ID=1~247 81 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :" 01 02 00 00 00 04"…..Read DI0~DI3 Digital Input readback value.

Response:" 01 02 01 08 "….. DI3=Enable.

6-3. Read Holding Registers

Read the current relay output readback count value

Command	ID 03 00 SS 00 NN		
Syntax Description	ID	1Byte	Address of setting module 1~247
	03	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0004
	00 NN	2 Bytes	Output channel number,0x0001~0x0004
Response	ID 03 BC NN NN	5 Bytes	ID=1~247 03:Function Code BC: Byte counter NN NN: Digital output read back value
Error Response	ID 83 ER	3 Bytes	ID=1~247 83 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :" 01 03 00 00 00 04 "…..Read digital RL11~RL4 readback counter value.

Response:" 01 03 08 00 03 00 12 00 37 00 12 ".

6-4. Read Input Registers

Read the current digital input count value

Command	ID 04 00 SS 00 NN		
Syntax Description	ID	1Byte	Address of setting module 1~247
	04	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0004
	00 NN	2 Bytes	Output channel number,0x0001~0x0004
Response	ID 0 BC NN NN	5 Bytes	ID=1~247 04:Function Code BC: Byte counter NN NN: Digital output read back value
Error Response	ID 84 ER	3 Bytes	ID=1~247 84 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :" 01 04 00 00 00 04 "…..Read CH0~CH3 read back counter value.

Response:" 01 04 08 00 01 00 01 03 FC 00 1E "….. Bytes Counter=8,DI0 =1, DI1=1,DI2=1020,DI3=30.

.6-5. Write Single Coil

Write Single channel output data

Command	ID 05 00 SS DD 00		
Syntax Description	ID	1Byte	Address of setting module 1~247
	05	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0003
	DD 00	2 Bytes	Write output data DD=FF.. Relay Enable DD=00 Relay Disable
Response	ID 05 00 SS DD 00	5 Bytes	Command Line
Error Response	ID 85 ER	3 Bytes	ID=1~247 85 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command :" 01 05 00 03 FF 00 "…..RLY4 Output Enable.

Response:" 01 05 00 03 FF 00"…Command Valid.

6-6. Write Coils

Write multi channel output data

Command	ID 0F 00 SS 00 NN BC 0L		
Syntax Description	ID	1Byte	Address of setting module 1~247
	0F	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0003
	00 NN	2 Bytes	Output channel number=0x0001~0x0004
	BC	1 Bytes	Byte counter
	0L	1 Bytes	Write output data L=0~F
Response	ID 0F 00 SS 00 NN	6 Bytes	Command Line
Error Response	ID 8F ER	3 Bytes	ID=1~247 8F :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example:

Send command:"01 0F 00 00 00 04 01 0B"…RL1,RL2,RL4 Enable.

Response:"01 0F 00 00 00 04"…Command Valid.

6-7. Write single register

Write single channel counter value

Command	ID 06 00 SS DD DD		
Syntax Description	ID	1Byte	Address of setting module 1~247
	06	1 Byte	Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0003
	DD DD	2 Bytes	Write Counter Vaile DDDD=0x0000~0xFFFF
Response	ID 06 00 SS DD DD	6 Bytes	Command Line
	ID 86 ER (CRC)	4 Bytes	ID 86 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Example: Send command :" 01 06 00 03 00 63 "…..Write DI3 Counter Value=99.

Response:"01 06 00 03 00 63 "….. Command Valid.

6-8. Write multiple registers

Write multi channel counter value

Command	ID 10 00 SS 00 CN BC DD DD ..		
Syntax Description	ID	1Byte	Address of setting module 1~247
	10	1Byte	10=Function Code
	00 SS	2 Bytes	Start channel number, 0x0000~0x0003
	00 CN	2 Bytes	Counter Number =0x0001~0x0004
	BC	1 Byte	Byte Counter
	DD DD…….	2~8 Bytes	Counter Vaile DDDD=0000~FFFF
Response	ID 10 00 SS 00 CN	6 Bytes	Command Line
	ID 90 ER	3 Bytes	ID 90 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Send command:" 01 10 00 00 00 04 08 00 0A 00 14 00 1E 00 28 "… Write DI0~DI3 Counter Value.

Response:"01 10 00 00 00 04"….. Command Valid.

6-9.Save multiple registers

Save current multi channel counter value to memory

Command	ID 10 00 00 00 01 02 00 00		
Syntax Description	ID	1Byte	Address of setting module 1~247
	10	1 Byte	10=Function Code
	00 00	2 Bytes	Start channel number, 0x0000
	00 01	2 Bytes	Counter Number =0x0001
	02 00 00	3 Bytes	Save all counters to memory
Response	ID 10 00 00 00 01	6 Bytes	Command valid
	ID 90 ER	3 Bytes	ID 90 :Function Code ER=00 Syntax error ER=01 Data Format error ER=02 Start channel error ER=03 I/O out of range

Send command:" 01 10 00 00 01 02 00 00"… Save all current counters Value to memory.

Response:"01 10 00 00 00 01"….. Command Valid.

6-10.Read the module's name

Command	ID 46 00 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function code
	00	Read module's name
	00	Reserved code
Response	ID 46 00 00 0C 28 00	ID 46 00 00 ….Module command Line 0C 28 :Module's Name is C28
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

EX: Send Command:"01 46 00 00"…….Read the TRP-C28's name.

Response:"01 46 00 00 0C 28 00 "……Module's name is C28.

Error Response: "01 C6 00"……Error code.

6-11. Setting module new ID

Command	ID 46 04 IP 00 00 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	04	Setting module ID
	IP	New module's ID
	00 00 00	Reserved code
Response	ID 46 04 00 00	ID 46 04 00 00 ….Command valid
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

EX: Send Command:"01 46 04 08 00 00 00"…….Set up the new ID is "03".

Response:"01 46 04 00 00 "……New ID is 08.

Error Response: "01 C6 00"……Error code.

6-12.Read the module's Firmware

Command	ID 46 07 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	07	Read module's Firmware
	00	Reserved code
Response	ID 46 07 **YY MM DD** 00	ID 46 07 ……Module command Line **YY**:Year **MM** :Month **DD:**Date 00 : Reserved code
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

Example:

Send Command:"01 46 07 00"…….Read Firmware Version.

Response:"01 46 07 13 02 28 00"…Firmware Version 02/28/2013.

Error Response: "01 C6 00"……Error code.

6-13.Enable/Disable watchdog

Command	ID 46 0B WS 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	0B	Setting Watchdog Status
	WS	WS=00 Watchdog Disable WS=01 Watchdog Enable
	00	Reserved code
Response	ID 46 0B 00	00 ID 46 0B 00 ……Command valid
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

Example:

Send Command:"01 46 0B 01 00"…….Watchdog Enable.

Response:"01 46 0B 00"…Command valid.

Error Response: "01 C6 00"……Error code.

6-14.Read watchdog status

Command	ID 46 0C 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	0C	Read watchdog status
	00	Reserved code
Response	ID 46 0C WT	ID 46 0C ……Module command line WT=01 Watchdog enable WT=00 Watchdog Disable
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

Example:

Send Command:”01 46 0C 00”…Read watchdog status.

Response:”01 46 0C 01 ….Watchdog enable.

Error Response: “01 C6 00”…Error code.

6-15.Set up LED ON/OFF

Command	ID 46 0D 0S 00	
Syntax Description	ID	Address of setting module 1~247
	46	Function Code
	0D	Set Up LED Status Value
	0S	S = 0 Turn on all LED when DIO enable off S = 1 Turn off all LED when DIO enable on
	00	Reserved code
Response	ID 46 0D 00	ID 46 0D ……Command valid
	ID C6 00	ID C6 C6:Function Code 00: Reserved code

Example:

Send Command:”01 46 0D 01 00.

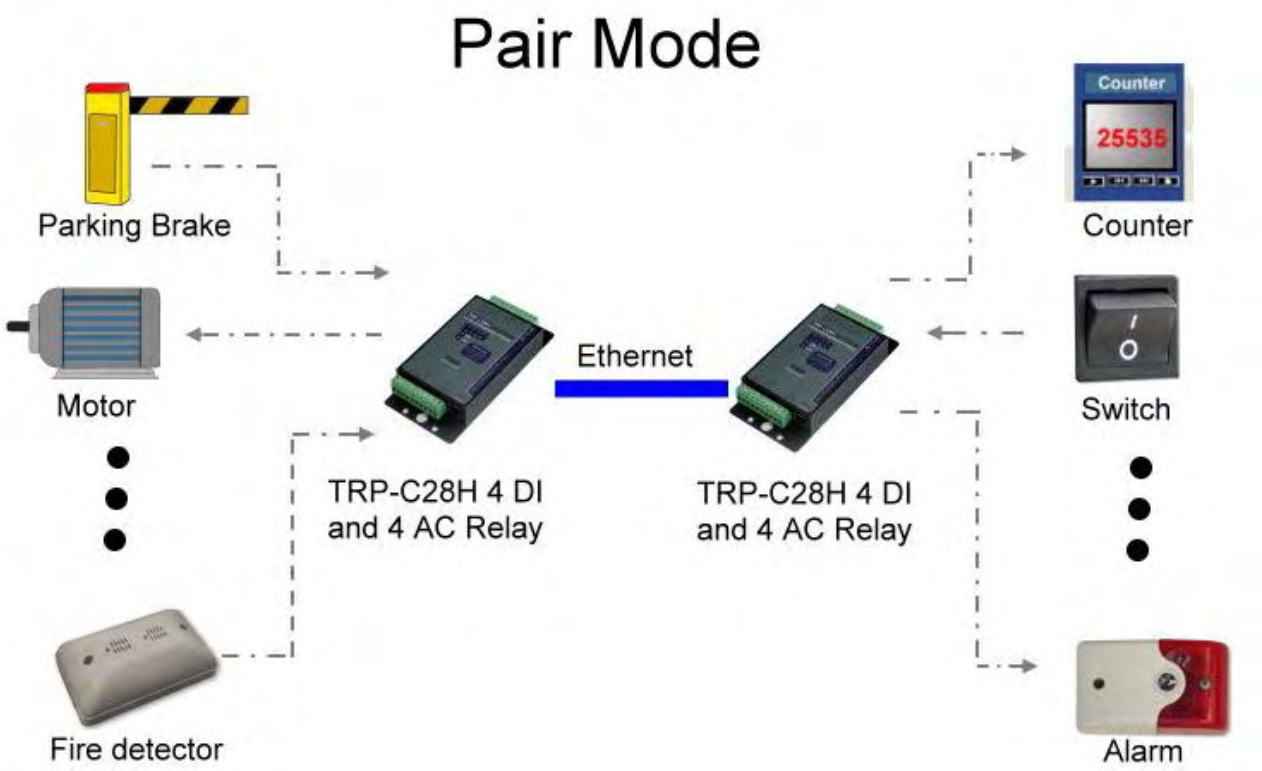
Response:”01 46 0D 00.

Error Response: “01 C6 00”…Error code.

7. Pair Mode

TRP-C28H support pairing mode with the TRP-C28H, Applied to 4 digital channels input and 4 AC relay output with over the network, without any driver with computer hardware.

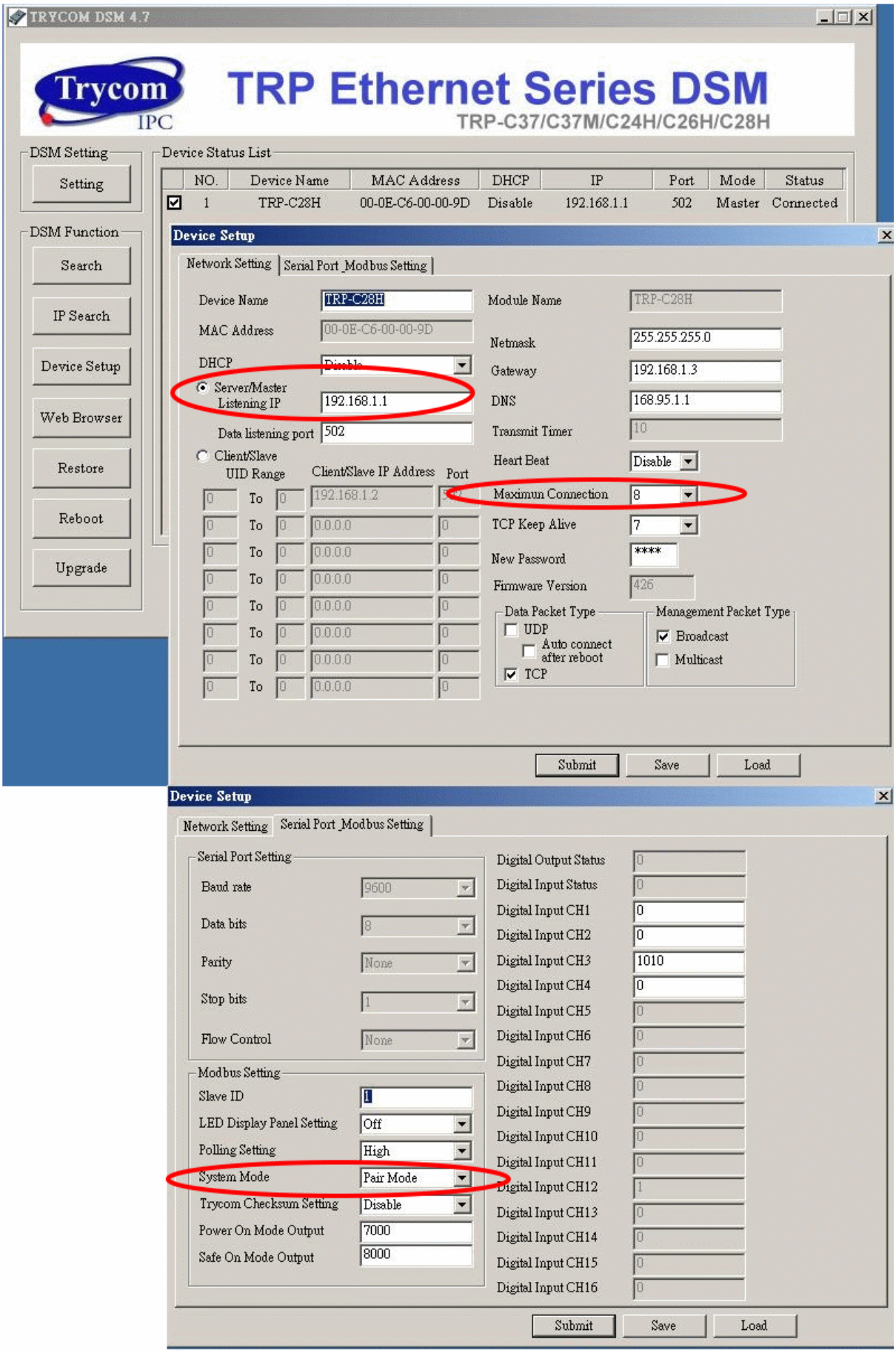
All digital LED flashes in pairing mode until successfully paired will stop blinking; TRP-C28H sustained in connection automatically, regardless of any party the power to re-open or network disconnection to ensure normal transmission. product application are as follows:



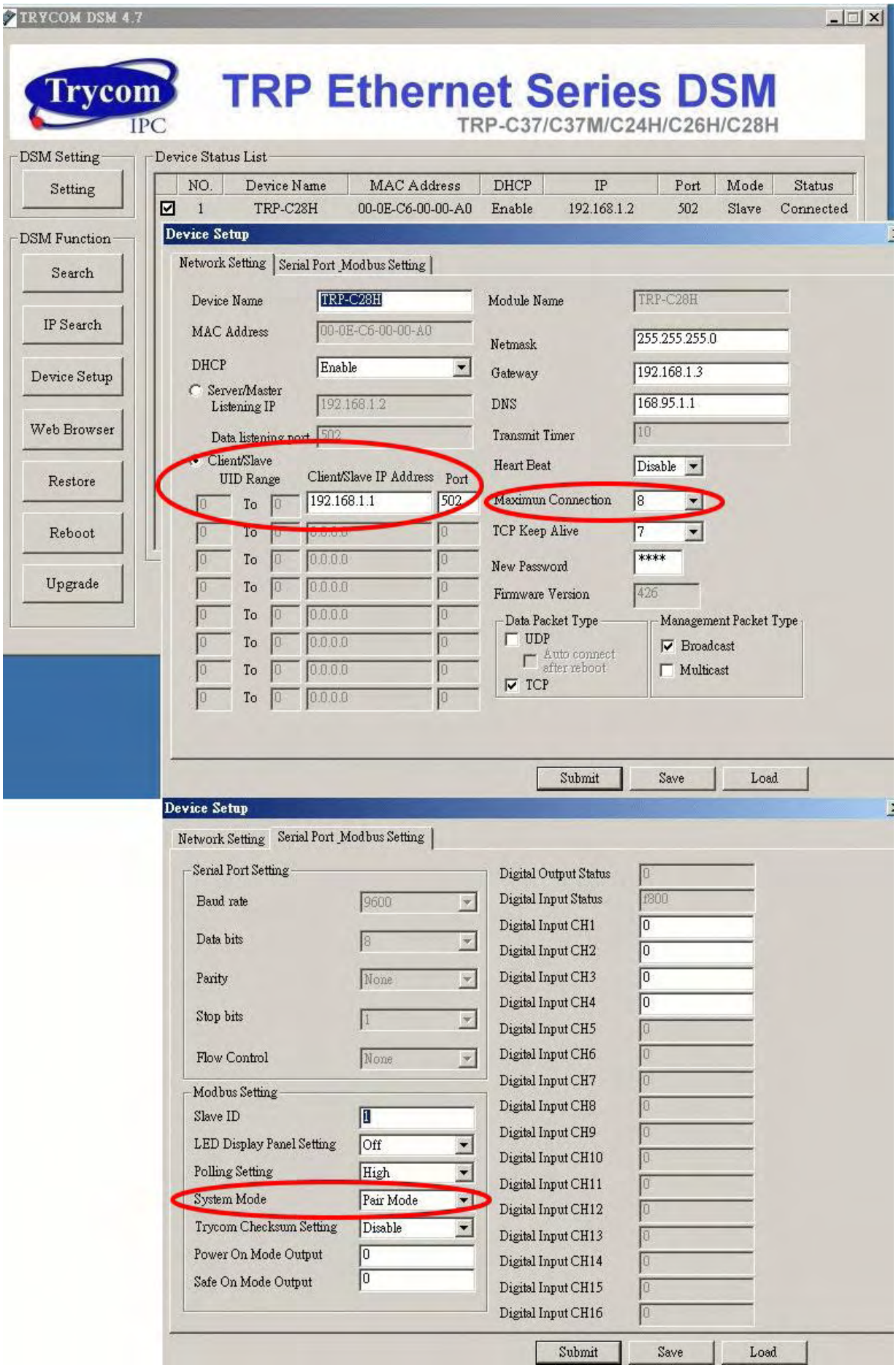
7-1 Parameter setting example

Perform DSM utility to change the parameters

- **TRP-C28H server parameter setting**



- **TRP-C28H Client parameter setting**



8. Application